which they concluded that carbon and vermilion introduced directly into the mouths of guinea pigs could be traced three hours later in considerable numbers in the intestinal walls, both inside and outside of the chyle ducts. These articles aroused considerable interest in the subject as shown by the appearance soon afterwards of papers by Remlinger, Mironesco, Basset, Herman, Schultze, Feliziani, Kuss and Lobstein, and others. Most of these observers, including the special commission appointed by the Societe de Biologie agree as to the entrance of foreign particles into the intestine and mesenteric glands but the question of how much if any of this pigment is deposited in the lungs was by no means definitely settled. Some of the writers, including Mafucci, and Basset and Carre claimed to have found the carbon in the liver and spleen only.

Montgomery in his restudy of the problem has concluded, contrary to general results obtained that no deposition occurred in the lungs after absorption from the intestine. It would therefore appear from his investigation that the intestine is an unimportant portal of entry in the production of pulmonary anthracosis. There is some evidence apart from the experimental which supports this view. Common experience has shown the predominance of the pulmonary deposition of carbon in human subjects with comparatively insignificant amounts in the liver, spleen and mesenteric lymph nodes whereas under experimental conditions of intestinal absorption the reverse order is observed. So far as bacteria are concerned such investigations may be suggestive but they cannot be said to throw any direct light on the question of bacterial absorption from the intestine in relation to pulmonary infection, especially pulmonary tuberculosis.

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## BRUDZINSKI'S SIGNS OF MENINGITIS.

Two years ago Brudzinski published his paper (Wien. klin. Woch., 1908, p. 255) on the "Contralateral Reflexes in the Legs in Childhood" and more recently his article (Archives de Medicine des Enfants, 1909, Vol. XII, p. 745) entitled "A New Sign in the Legs in Meningitis in Childhood; the Neck Sign." Since the appearance of these contributions to the study of meningitis a number of clinical investigators have carefully studied their significance. Judging from their experience the phenomena described by Brudzinski are destined to be of practical value and his observations are contributions of genuine value in the bedside recognition of meningeal inflammations.

The "leg sign" consists of a concomitant reflex of the leg on one side when passive flexion of the leg is made on the other side—the identical contralateral reflex. Instead of flexion extension is sometimes noted—reciprocal contralateral reflex. Brudzinski observed the identical contralateral reflex in 6, and the reciprocal contralateral reflex in 1 of 8 cases of tuberculous meningitis, and the identical contralateral reflex in both of 2 cases of cerebrospinal meningitis. In some cases the reflex was present on both sides. He concluded that in connection with other signs, such as Kernig's and Babinski's, it was useful in the differential diagnosis of meningitis. In his later paper he states that further study has still more convinced him of the value of the sign, and that it has materially aided him in the diagnosis of certain cases in which Kernig's and Babinski's signs were absent.

The explanation of the phenomenon is based on the assumption that there is a congenital tendency to bilateral innervation and that there is an anatomical connection between the centers of corresponding muscles. It is also assumed that this connection is more definite and persists longer in the legs than in the arms on account of the slighter differentiation of function in the former, and that when the cerebrum is diseased there is in infancy and childhood a tendency for the more specialized functions to revert to the younger type. The result of such reversion would in the author's opinion account for the production of the contralateral reflex.

Greco (Revue d'Hygiene et de Medicine Infantile, 1909, Vol. VIII, p. 130) who has investigated this sign states that he has never observed it in healthy children or in those ill with gastrointestinal or pulmonary diseases, rickets, acute infantile paralysis, chronic internal hydrocephalus, idiocy, or chorea. Zaimovsky (Archives de Medicine des Enfants, 1909, Vol. XII, p. 796) confirms these observations and agrees with Greco that the sign is of indisputable clinical importance in the diagnosis of meningeal inflammation.

The "neck sign" consists on the other hand of a flexion of the legs at the hips and knees and a marked flexion of the legs on the pelvis when the neck is flexed forward. Brudzinski found this sign in 20 of 21 cases of tuberculous meningitis, and in all of 11 of the cerebrospinal form. More recently Morse (Archives of Pediatrics, 1910, Vol. XXVII, p. 561) of Boston has very carefully investigated both the leg and neck phenomena and concludes from the study of 400 cases that Brudzinski and others are correct in their statements that neither sign is present in well children or in those ill with diseases other than of the nervous system, and that they are rarely observed in conditions of the nervous system other than meningitis. This writer also states that the contralateral reflex is found much less commonly than the neck sign, and that both may occur intermittently or be absent throughout the whole course of the disease. He believes, however, that their presence in an acute disease is strong evidence in favor of meningitis, but that their absence does not exclude this disease. It therefore appears that the presence of the neck sign is of positive value in the diagnosis of meningitis while the leg phenomenon on account of its greater inconstancy is less valuable.